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CURRENT LITERATURE

BOOK REVIEWS

Yeasts

A few years ago a group of French savants arranged for a new *Encyclopêdie Scientifique*. Under the direction of TOULOUSE, some of the most distinguished scientists are attempting to prepare a series of complete and readable monographs covering the whole range of science. The plan calls for about a thousand volumes, classified under forty main sections of knowledge.

If GUILLIERMOND'S[1] volume on yeasts is a fair sample, this encyclopedia will be indispensable to every school of science. This volume includes an ample bibliography, index, and analytic table of contents. The introduction defines the yeasts, morphologically and physiologically, and places them as "a family of the Ascomycetes, known by the name of Saccharomycetes." A brief historical résumê concludes that three names will always be connected with the study of yeasts, PASTEUR, HANSEN, and BUCHNER.

The first chapter deals with the morphology of vegetation and reproduction. The second one, on cytology, discusses the nucleus, metachromatic bodies, and other particles, both in vegetation and reproduction. The metachromatic bodies are stated to be composed probably of a compound of nucleic acid. They are identical with A. MEYER'S volutin grains. Two chapters on physiology are rich in material. The subjects of the following chapters are phylogeny, methods of study and culture, identification of species, variation of species, and classification. The second part is a systematic description of the known genera and species. Constant reference throughout all the chapters to the little known Schizomyces and Zygosaccharomyces adds much to the interest of the work. Every page of this admirable volume is full of clear, terse statements of observation, and carefully balanced discussion. It is rare for as keen an investigator to have such a lucid and logical style.

The translation of GUILLIERMOND by TANNER[2] is really a new edition. In bringing the work up to date, GUILLIERMOND has been responsible for the morphology, phylogeny, and classification, and TANNER for the physiology. Most of the text, however, is carried over without change. Unfortunately, the translation has been poorly done. Almost every page of the English edition furnishes distressing mistranslations. When the French idiom *ne* . . . . *que* is translated as a flat negative, the author is made to say the exact reverse of what he means, and the rest of the paragraph becomes absurd. The French use of the article has been carried over literally, even where it fits the English idiom! Again, where the author says, for example, a fluid *may reach* a certain concentration, the faithful translator puts it, *is able to reach*. "Matières hydrocarbonnes" becomes "hydrocarbon materials," in heavy-faced type; and the paragraph discusses sugar, cellulose, and glycogen! Perhaps the consistent reference to WAGER as WAGNER in the text is an error of proofreading, for the name is correct in the bibliography and in the French text. The American book is very well printed, with large, open, legible type, but no one can safely use it without having a copy of the original at hand, or at least without having enough knowledge of French to read the original author's meaning between the lines.—H. S. CONARD.

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[1] GUILLIERMOND, A. T., Les Levures. II. pp. 565. Paris: Octave Doin et fils. 1912.

[2] GUILLIERMOND, A. T., The yeasts. Translated and thoroughly revised in collaboration with the original author by F. W. TANNER. pp. xix+424. New York: John Wiley and Sons. 1920.

NOTES FOR STUDENTS

Electrons in photosynthesis.—An attempt has been made by DIXON and POOLE[3] to interpret photosynthesis in terms of the electronic theory. On the basis of photo-electric phenomena in sensitizers of photographic films, and the absorption spectra of chlorophyll, they believe that the first action of light is to disturb electrons in the chlorophyll molecule. Experiments were made to determine whether the electrons were actually ejected by the incident radiation, or whether the disturbances were too weak to do more than displace the electrons within groups of atoms, or from molecule to molecule of chlorophyll.

By delicate electrometer measurements they were able to establish the occurrence of a slight photo-electric effect in chlorophyll under illumination, but this effect is apparently produced by ultra violet radiations, not by those of visible frequencies and synthetic activity, for they find that the effect is magnified about 2000 times by use of a light rich in ultra violet rays. Quantitative use of the data showed that possibly 75 electrons per square centimeter per second might be ejected from a layer of chlorophyll by light from a 500 watt lamp. In terms of energy, this effect is utterly negligible, for the actual synthesis of food in plants goes on at a rate which would require about nine trillion times as much energy as these ejected electrons could supply. It is necessary to conclude, therefore, that ejection of electrons is not significant in photosynthesis, and that the chlorophyll cannot ionize substances external to itself by electronic bombardment. If this be true, then the synthetic reactions must concern the chlorophyll molecule itself, and the electrons are merely shifted from atom to atom, or molecule to molecule, as in ordinary chemical reactions. These shiftings, of course, will alter linkages, and change the chemical character of atomic groups, probably rendering inactive groups of atoms reactive. Such

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[3] DIXON, HENRY H., and POOLE, HORACE H., Photosynthesis and the electronic theory. Sci. Proc. Roy. Dublin Soc. **16**:63–77. 1920.